

CLAIMS

What is claimed is:

- 1 1. A method for electrically interconnecting a signal  
2 between a first circuit board and a second circuit board,  
3 the first circuit board having a first signal conducting  
4 means formed therein, the second circuit board having a  
5 second signal conducting means formed therein, the first  
6 signal conducting means being shielded by a first  
7 electrically conductive shield, the second signal conducting  
8 means being shielded by a second electrically conductive  
9 shield, the method comprising the steps of:  
10 forming a first opening in the first electrically  
11 conductive shield so as to expose the first signal  
12 conducting means in the first circuit board;  
13 forming a second opening in the second electrically  
14 conductive shield so as to expose the second signal  
15 conducting means in the second circuit board;  
16 applying an electrically conductive adhesive, solder  
17 paste, or interposer/elastomer device around at least one of  
18 the first and second openings and within at least one of the  
19 first and second openings; and

20       securing the first circuit board and the second circuit  
21 board such that the first opening and the second opening are  
22 aligned and a signal propagating along the first signal  
23 conducting means is electrically interconnected to the  
24 second               signal               conducting               means.

1     2.   The method as defined in claim 1, further comprising  
2     the step of:

3       applying the electrically conductive adhesive or solder  
4 paste within at least one of a first via located within the  
5 first opening and a second via located within the second  
6 opening.

1     3.   The method as defined in claim 1, wherein the first  
2 signal conducting means comprises a pair of signal  
3 conductors and the second signal conducting means comprises  
4 a pair of signal conductors.

1     4.   The method as defined in claim 1, wherein the first  
2 signal conducting means and the second signal conducting  
3 means each comprise a single conductor.

1 5. The method as defined in claim 1, wherein the first  
2 circuit board and the second circuit board are multilayer  
3 circuit boards, wherein the first electrically conductive  
4 shield and the second electrically conductive shield are  
5 respective electrically conductive layers of the first  
6 circuit board and the second circuit board.

1 6. The method as defined in claim 5, wherein the first  
2 electrically conductive shield and the second electrically  
3 conductive shield are formed by the respective ground plane  
4 layers of the first circuit board and the second circuit  
5 board.

1 7. The method as defined in claim 6, wherein the first  
2 signal conducting means and the second signal conducting  
3 means are formed on respective signal layers of the first  
4 circuit board and the second circuit board, wherein the  
5 signal layers are disposed beneath the ground plane layers  
6 in the first circuit board and the second circuit board.

1 8. The method as defined in claim 1, wherein the signal is  
2 carries data at a rate on the order of 1 Gb/s and above.

1 9. The method as defined in claim 1, wherein the first  
2 circuit board has a third signal conducting means formed  
3 therein, wherein the second circuit board has a fourth  
4 signal conducting means formed therein, the third signal  
5 conductor being shielded by a third electrically conductive  
6 shield, the fourth signal conducting means being shielded by  
7 a fourth electrically conductive shield, further comprising  
8 the steps of:  
9 forming a third opening in the third electrically  
10 conductive shield so as to expose the third signal  
11 conducting means in the first circuit board;  
12 forming a fourth opening in the fourth electrically  
13 conductive shield so as to expose the fourth signal  
14 conducting means in the second circuit board;  
15 applying an electrically conductive adhesive, solder  
16 paste, or interposer/elastomer device around at least one of  
17 the third and fourth openings and within at least one of the  
18 third and fourth openings; and  
19 securing the first circuit board and the second circuit  
20 board such that the third opening and the fourth opening are  
21 aligned and another signal propagating along the third

22 signal conducting means is electrically interconnected to  
23 the fourth signal conducting means.

1 10. The method as defined in claim 9, wherein the third  
2 electrically conductive shield is electrically connected to  
3 the first electrically conductive shield, wherein the fourth  
4 electrically conductive shield is electrically connected to  
5 the second electrically conductive shield.

1 11. The method as defined in claim 1, wherein the first  
2 circuit board is a motherboard, wherein the second circuit  
3 board is a daughterboard.

1 12. The method as defined in claim 11, wherein the  
2 daughterboard is formed at least partially of flexible  
3 material so as to allow angular mating with the motherboard.

1 13. A system for electrically interconnecting a signal  
2 between circuit boards, the system comprising:

3 a first circuit board having, a first signal conducting  
4 means formed therein, the first signal conducting means  
5 being shielded by a first electrically conductive shield,  
6 the first electrically conductive shield having a first  
7 opening formed therein so as to expose the first signal  
8 conducting means in the first circuit board;

9 a second circuit board having a second signal  
10 conducting means formed therein, the second signal  
11 conducting means being shielded by a second electrically  
12 conductive shield, the second electrically conductive shield  
13 having a second opening formed therein so as to expose the  
14 second signal conducting means in the second circuit board;  
15 and

16 an electrically conductive adhesive, solder paste, or  
17 interposer/elastomer device applied surrounding at least one  
18 of the first and second openings and within at least one of  
19 the first and second openings;

20 wherein the first circuit board and the second circuit  
21 board are electrically interconnected by the electrically  
22 conductive adhesive, solder paste, or interposer/elastomer  
23 device such that the first opening and the second opening  
24 are aligned and a signal propagating along the first signal  
25 conducting means is electrically interconnected to the  
26 second signal conducting means.

1 14. The system as defined in claim 13, further comprising:

2 electrically conductive adhesive or solder paste within  
3 a first via located within the first opening and within a  
4 second via located within the second opening.

1 15. The system as defined in claim 13, wherein the first  
2 signal conducting means comprises a pair of signal  
3 conductors and the second signal conducting means comprises  
4 a pair of signal conductors.

1 16. The system as defined in claim 15, wherein the first  
2 signal conducting means and the second signal conducting  
3 means each comprise a single conductor.

1 17. The system as defined in claim 13, wherein the first  
2 circuit board and the second circuit board are multilayer  
3 circuit boards, wherein the first electrically conductive  
4 shield and the second electrically conductive shield are  
5 respective electrically conductive layers of the first  
6 circuit board and the second circuit board.

1 18. The system as defined in claim 13, wherein the first  
2 electrically conductive shield and the second electrically  
3 conductive shield are formed by respective ground plane  
4 layers of the first circuit board and the second circuit  
5 board.

1 19. The system as defined in claim 13, wherein the first  
2 signal conductor and the second signal conductor are formed  
3 on respective signal layers of the first circuit board and  
4 the second circuit board, wherein the signal layers are  
5 disposed beneath the ground plane layers in the first  
6 circuit board and the second circuit board.

1 20. The system as defined in claim 13, wherein the signal  
2 carries data at a rate on the order of 1 Gb/s and above.

1 21. The system as defined in claim 13,  
2 wherein the first circuit board has a third signal  
3 conducting means formed therein, wherein the third signal  
4 conducting means is shielded by a third electrically  
5 conductive shield, wherein a third opening is formed in the  
6 third electrically conductive shield so as to expose the  
7 third signal conducting means in the first circuit board;

8 wherein the second circuit board has a fourth signal  
9 conducting means formed therein, wherein the fourth signal  
10 conducting means is shielded by a fourth electrically  
11 conductive shield, wherein a fourth opening is formed in the  
12 fourth electrically conductive shield so as to expose the  
13 fourth signal conducting means in the second circuit board;



14 wherein an electrically conductive adhesive, solder  
15 paste, or interposer/elastomer device is applied around at  
16 least one of the third and fourth openings and within at  
17 least one of the third and fourth openings; and

18 wherein the first circuit board and the second circuit  
19 board are positioned such that the third opening and the  
20 fourth opening are aligned and a another signal propagating  
21 along the third signal conducting means is electrically  
22 connected to the fourth signal conducting means.

1 22. The system as defined in claim 21, wherein the  
2 third electrically conductive shield is electrically  
3 connected to the first electrically conductive shield,  
4 wherein the fourth electrically conductive shield is  
5 electrically connected to the second electrically conductive  
6 shield.

1 23. The system as defined in claim 13, wherein the  
2 first circuit board is a motherboard, wherein the second  
3 circuit board is a daughterboard.

1 24. The system as defined in claim 22, wherein the  
2 daughterboard is formed at least partially of flexible  
3 material so as to allow angular mating with the motherboard.

25. A method for electrically interconnecting at least one signal between a first circuit board and a second circuit board, the first circuit board having a first signal conducting means formed therein, the second circuit board having a second signal conducting means formed therein, the first signal conducting means being shielded by an electrically conductive shield, the method comprising the steps of:

forming an opening in the electrically conductive shield so as to expose the first signal conducting means in the first circuit board;

applying an electrically conductive adhesive, solder paste, or interposer/elastomer device surrounding the opening and within the opening; and

positioning the first circuit board and the second circuit board such that the first signal conducting means and the second signal conducting means are aligned through the opening and a signal propagating along the first signal conducting means is electrically interconnected to the second signal conducting means.

1           26. The method as defined in claim 25, wherein the  
2 first signal conducting means and the second signal  
3 conducting means each comprise a pair of signal conductors  
4 and the step of applying and electrically conductive  
5 adhesive or solder paste within the opening comprises  
6 applying adhesive within two vias joined to one of the pairs  
7 of signal conductors.

1           27. The method as defined in claim 25, wherein the  
2 first signal conducting means and the second signal  
3 conducting means each comprise a single signal conductor and  
4 the step of applying electrically conductive adhesive or  
5 solder paste within the opening comprises applying  
6 conductive adhesive or solder paste within at least one via  
7 to reach the single signal conductor.

1           28. A system for electrically interconnecting a signal  
2 between circuit boards, the system comprising:  
3           a first circuit board having a first signal conducting  
4 means formed therein, the first signal conducting means  
5 being shielded by a first electrically conductive shield,  
6 the first electrically conductive shield having a first

7 opening formed therein so as to expose the first signal  
8 conducting means in the first circuit board; and  
9 a second circuit board having a second signal  
10 conducting means formed therein; and  
11 an electrically conductive adhesive, solder paste, or  
12 interposer/elastomer device surrounding the first opening  
13 and applied within the first opening,  
14 wherein the first circuit board and the second circuit  
15 board are positioned such that the first signal conducting  
16 means and the second signal conducting means are aligned  
17 through the opening and a signal propagating along the first  
18 signal conducting means is electrically interconnected to  
19 the second signal conducting means.

1 29. The system as defined in claim 28, wherein the  
2 first signal conducting means comprises a first pair of  
3 conductors and the second signal conducting means comprises  
4 a second pair of conductors and each conductor of the first  
5 pair is connected with a conductor of the second pair for  
6 transmission of two signals between the first pair and the  
7 second pair.

30. The system as defined in claim 28, wherein the first signal conducting means comprises a single conductor and the second signal conducting means comprises a single conductor.

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